City of Dublin, CA
Community Development Department
Building and Safety Division

STRUCTURAL DESIGN INTERPRETATION

POLICY NO.: BDP 22
EFFECTIVE: November 1, 2002
REVISED: N/A
APPROVED BY: Gregory A. Shreeve, Sr., Building Official
SUBJECT: Horizontal Torsional Moments

Regarding Section 1630.7 of the 1997 Uniform Building Code (Vol. 2)

1630.7 Horizontal Torsional Moments. Provisions shall be made for the increased shears resulting from horizontal torsion where diaphragms are not flexible. The most severe load combination for each element shall be considered for design.

The torsional design moment at a given story shall be the moment resulting from eccentricities between applied design lateral forces at levels above that story and the vertical-resisting elements in that story plus an accidental torsion.

The accidental torsional moment shall be determined by assuming the mass is displaced as required by Section 1630.6.

Where torsional irregularity exists, as defined in Table 16-M, the effects shall be accounted for by increasing the accidental torsion at each level by an amplification factor, Ax, determined from the following formula:
(30-16)

WHERE:

davg = the average of the displacements story drift at the extreme points of the structure at Level x.
dmax = the maximum displacement story drift at Level x.
The value of Ax need not exceed 3.0.

Reason for amendment:
The approved language replaces the word "displacement" with "drift", which is more appropriate when considering amplification of the diaphragm torsional effects.

The latter part of the original proposal which would have exempted the diaphragms in light-frame construction altogether from torsional amplification, was not approved by the committee. The committee believes that another amendment (item 12) dealt with this issue by allowing such diaphragms to be considered flexible in most situations. Therefore, there is no justification for additional relaxation of diaphragm rigidity consideration.

Findings (based upon local geologic, topographic or climatic conditions):
The amendment is needed due to local geological conditions.

The San Francisco Bay area region is densely populated and/or located in an area of high seismic activities as indicated by United States Geological Survey and California Division of Mines and Geology. Recent earthquake activities, including the 1989 Loma Prieta earthquake, have indicated the lack of adequate design and detailing as a contributing factor to damages that reduced the protection of the life-safety of building occupants.